Claims:

1. A method for treating an ischemic tissue in a subject in need thereof, comprising administering to said subject a therapeutically effective amount of enriched human endothelial generating cells and enriched human mesenchymal stem cells.

2. The method of claim 1, wherein the human endothelial generating cells are human endothelial precursor cells.

3. The method of claim 1, wherein the endothelial progenitor cells are generated in culture from hematopoetic stem cells, hemangioblasts or embryonic stem cells.

4. The method of claim 1, wherein treatment of the ischemic tissue induces

(a) formation of blood vessels supplying blood to the ischemic tissue;
(b) blood flow to the ischemic tissue;
(c) oxygen supply to the ischemic tissue; or
(d) a combination thereof.

5. The method of claim 1, wherein the endothelial generating cells are isolated from umbilical cord blood.

6. The method of claim 1, wherein the endothelial generating cells are isolated from bone marrow or from peripheral blood.

7. The method of claim 1, wherein the endothelial generating cells are enriched at least two-fold prior to the prior to administration to the subject.

8. The method of claim 1, wherein the endothelial generating cells are culture-expanded under endothelial cell-promoting culture conditions prior to administration to the subject.

9. The method of claim 1, wherein the endothelial generating cells are autologous.

10. The method of claim 1, wherein the endothelial generating cells are allogeneic.

11. The method of claim 1, wherein the endothelial generating cells are HLA compatible with the subject.

12. The method of claim 1, wherein the endothelial generating cells are $CD31^+$, $CD146^+$, $CD133^+$, $CD34^+$,VE-cadherin$^+$ or a combination thereof.

13. The method of claim 1, wherein the endothelial generating cells are $CD133^+$.

14. The method of claim 1, wherein the endothelial generating cells are $CD34^+$.

15. The method of claim 1, wherein the endothelial generating cells are generated in culture from hematopoetic stem cells, hemangioblasts or embryonic stem cells.

16. The method of claim 1, wherein the endothelial generating cells are endothelial progenitor cells, hemangioblasts or hematopoetic stem cells, or a combination thereof.

17. The method of claim 1, wherein the human mesenchymal stem cells are isolated from bone marrow.

18. The method of claim 1, wherein the human mesenchymal stem cells are isolated from umbilical cord blood.

19. The method of claim 1 wherein the human mesenchymal stem cells are culture-expanded prior to administering the human mesenchymal stem cells to the subject.

20. The method of claim 19, wherein the human mesenchymal stem cells are culture-expanded to enrich for cells containing surface antigens identified by monoclonal antibodies SH2, SH3 or SH4, prior to administering the human mesenchymal stem cells to the subject.

21. The method of claim 1, wherein the human mesenchymal stem cells are autologous.

22. The method of claim 1, wherein the human mesenchymal stem cells are allogeneic.

23. The method of claim 1, wherein the human mesenchymal stem cells are HLA compatible with the subject.

24. The method of claim 1, wherein the therapeutically effective amount of enriched human endothelial generating cells and enriched human mesenchymal stem cells is safe.

25. The method of claim 1, wherein the therapeutically effective amount of enriched human endothelial generating cells comprises at least 1×10^4 human endothelial generating cells.

26. The method of claim 1, wherein the wherein the therapeutically effective amount of enriched human endothelial generating cells comprises is between 1×10^4 to 5×10^8 human endothelial generating cells.

27. The method of claim 2, wherein the therapeutically effective amount of the endothelial generating cells and the human stromal cells is a minimum number of cells necessary for increased blood flow induction to the ischemic tissue.

28. The method of claim 1, wherein the human endothelial generating cells and the human mesenchymal stem cells are administered in a ratio from about 5:1 to about 1:5.

29. The method of claim 1, wherein administering to the subject comprises a systemic infusion of the human endothelial generating cells.

30. The method of claim 1, wherein administering to the subject comprises an infusion of the human endothelial generating cells into bone marrow.

31. The method of claim 1, wherein administering to the subject comprises an intra-arterial infusion of the human endothelial generating cells.

32. The method of claim 1, wherein administering to the subject comprises an intracardiac infusion of the human endothelial generating cells.

33. The method of claim 1, administering to the subject comprises an intracoronary infusion of the human endothelial generating cells.

34. The method of claim 33, wherein said subject is in need of treatment for chronic myocardial ischemia.

35. The method of claim 1, wherein administering to the subject comprises using an intra-arterial catheter or a stent.

36. The method of claim 1, wherein said subject is in need of treatment for ischemia selected from the group consisting of limb ischemia, ischemic cardiomyopathy, myocardial ischemia , cerebrovascular ischemia, renal ischemia, pulmonary ischemia and intestinal ischemia.

37. The method of claim 1, wherein the human endothelial generating cells are genetically modified.

38. The method of claim 37, wherein the human endothelial generating cells are genetically modified to express a recombinant polypeptide.

39. The method of claim 38, wherein the recombinant polypeptide is VEGF, BFGF, SDF, CXCR-4 or CXCR-5.

40. The method of claim 1, further comprising administering to the subject at least one recombinant polypeptide.

41. The method of the claim 40, wherein the recombinant polypeptide is VEGF, BFGF, SDF, CXCR-4 or CXCR-5.

42. The method of claim 38, wherein the recombinant polypeptide promotes angiogenesis, vasculogenesis, or both.

43. The method of the claim 38, wherein the recombinant polypeptide is selected from among a growth factor, a cytokine, a chemokines or a receptor thereof.

44. A method for increasing blood flow to an ischemic myocardium in a subject in need hereof, comprising administering to the subject a therapeutically effective amount of enriched human endothelial precursor cells and enriched human mesenchymal stem cells.

45. The method of claim 44, wherein the endothelial precursor cells are $CD133^+$ human endothelial precursor cells.

46. The method of claim 44, wherein the endothelial precursor cells are $CD34^+$ human endothelial precursor cells.

47. The method of claim 44, wherein the endothelial generating cells are culture-expanded under endothelial cell-promoting culture conditions prior to administration to the subject.

48. The method of claim 44, wherein the endothelial precursor cells are isolated from umbilical cord blood.

49. The method of claim 44, wherein the human mesenchymal stem cells are expanded in culture prior to administration to the subject.

50. The method of claim 44, wherein the human endothelial precursor cells and the human mesenchymal stem cells are administered by infusion into at least one coronary artery.

51. The method of claim 44, wherein said ischemic myocardium comprises an area of viable myocardium.

52. The method of claim 44, wherein the coronary artery is an epicardial vessel that provides collateral blood flow to said ischemic myocardium in the distribution of a chronic totally occluded vessel.

53. The method of claim 44, wherein the endothelial precursor cells and the mesenchymal stem cells are administered in a ratio from about 5:1 to about 1:5.

54. A method for improving blood flow to an ischemic myocardium having an area of viable myocardium in a subject in need thereof, comprising administering to said subject a therapeutically effective amount of enriched $CD133^+/CD34^+$ endothelial precursor cells isolated from umbilical cord blood, wherein the enriched $CD133^+/CD34^+$ endothelial precursor cells are administered by infusion into a coronary artery that is an epicardial vessel that provides collateral flow to said ischemic but viable myocardium in the distribution of a chronic totally occluded vessel, and wherein administering of the $CD133^+/CD34^+$ endothelial precursor cells results in improved blood flow to said ischemic myocardium.

55. The method of claim 54, further comprising administering to the subject enriched human mesenchymal stem cells.

56. The method of claim 54, wherein the human mesenchymal stem cells are isolated from said subject.

57. A method for inducing the formation of blood vessels in an ischemic tissue in a subject in need thereof, comprising administering to said subject a therapeutically effective amount of enriched human endothelial generating cells and enriched human mesenchymal stem cells.

58. A pharmaceutical formulation, comprising:

(a) $CD133^+/CD34^+$ cells enriched from umbilical cord blood;

(b) mesenchymal stem cells containing surface antigens identified by monoclonal antibodies SH2, SH3 or SH4 enriched from bone marrow; and

(c) a pharmaceutically acceptable carrier.

59. The formulation of claim 58, comprising from 10^4 to 10^9 $CD133^+/CD34^+$ cells.

60. The formulation of claim 58, comprising from 10^4 to 10^9 mesenchymal stem cells.

61. The formulation of claim 58, wherein the formulation is prepared for administration by a catheter.